

REMARKS

Claims 1-10 and 12-23 are pending in the current application. Claims 1, 7, 8 and 9 are independent claims. Dependent claims 22 and 23 are newly-added. In view of the above amendments and following remarks, favorable reconsideration and allowance of the present application is respectfully requested.

Applicants note that the Examiner has not indicated whether the drawings filed on December 23, 2005 are accepted, or objected to, by the Examiner. As there is no discussion in the *Detailed Action* indicating that the drawings are objected to, Applicants will assume that the drawings are acceptable unless indicated otherwise in the next Patent Office communication.

I. **CLAIM AMENDMENTS**

By the present Amendment, Applicants submit that independent claim 1 is amended and claims 22 and 23 are newly-added. The amendments to independent claim 1 are supported at least by page 41, lines 3-12 of the originally-filed Specification. Newly-added claims 22 and 23 are supported at least by original claim 1 and Examples 1-13 of the Specification. Thus, Applicants submit that amended claim 1, and newly-added claims 22 and 23 do not introduce new matter.

II. **CITED ART GROUNDS OF REJECTION**

Claims 1-4, 7-10 and 12-21 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by or, in the alternative under 35 U.S.C. §103(a) as being obvious over Mertens et al. (hereinafter “Mertens”), U.S. Patent No. 6,605,673; claims 1-6 stand rejected under 35 U.S.C. §102(a) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Hatsuda et al. (hereinafter “Hatsuda”), U.S. Patent No.

6,562,879; claims 1-4 stand rejected under 35 U.S.C. §102(e) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as allegedly being obvious over Nakashima et al. (hereinafter “Nakashima”), U.S. Patent Publication No. 2004/0106745 A1. Applicants respectfully traverse the rejections.

A. INDEPENDENT CLAIM 1

Independent claim 1 has been amended to recite a water absorbent resin composition including (*inter alia*) “an extraction rate of the multivalent metal component around a surface of said particulate water absorbent resin is 5.0 wt % or more and less than 70 wt %.” Non-limiting, example embodiments may be found throughout the Specification. Applicants direct the Examiner’s attention, for example, to page 41, lines 3-12 of the Specification. Applicants submit that the art cited by the Examiner fails to teach, or suggest, the above features recited in amended independent claim 1.

i. MERTANS

Further to the Applicants’ arguments submitted in the Amendment filed on July 16, 2007, the Examiner states that “[t]he components in the instant invention of examples 5, 6 and comparative run 8 include different variables...Back-to-back runs require that components remain the same in all trials with the inventive feature being different. Therefore, it is not clear if the differences in metal extraction rates are related to the type of organic crosslinker, multivalent metal, reaction conditions of the amount of water.” Action, p. 5.

However, Applicants note that example embodiments teach that,

In an experiment for clearly showing effects of such surface treatment, it is preferable to compare effects with each other by using the same precursor like the water absorbent resin (A). For example, when the particle size distribution

of the precursor varies, it may be impossible to exactly evaluate parameters, such as SFC, which depends on the particle size. Further, in comparing SFCs indicative of performances of the water absorbent resins, it is preferable to compare SFC of a water absorbent resin with SFC of another water absorbent resin having substantially the same CRC as that water absorbent resin.

Table 4 shows that: the water absorbent resin composition (1), obtained in Example 5, whose multivalent metal component (aluminum) concentration in the surface treatment agent is high, has much higher SFC and AAP than those of the comparative water absorbent resin composition (1) obtained in the Comparative Example 7 though the water absorbent resin composition (1) has the same CRC as that of the comparative water absorbent resin composition (1).

Specification, pg. 107, l. 16 – pg. 108, l. 14.

Thus, Example 5 and Comparative Example 7 were formulated such that both examples i) are derived from the water absorbent resin (A1) obtained in Referential Example 6, and ii) have a similar centrifuge retention capacity (CRC) of 28.2 g/g and 28.4 g/g, respectively. Similarly, in an comparison of Example 6 and Comparative Example 8, Applicants note that both examples i) are derived from the water absorbent resin (A1) obtained in Referential Example 6, and ii) have an identical centrifuge retention capacity (CRC) of 28.0 g/g.

Therefore, Applicants submit that it is possible to compare such parameters as saline flow conductivity (SFC) in a resin wherein the multivalent metal component (and accordingly, the multivalent metal component extraction rate) is increased (e.g., as in Example 6) to a resin wherein the multivalent metal component has not been increased (e.g., as in Comparative Example 8).

Accordingly, Applicants maintain that Comparative Example 8 includes a similar composition as Example 3 of Mertens. Moreover, the extraction rate (M) of Comparative Example 8 is 2.9 wt %, lower than the “5.0 wt % or more” as recited in independent claim 1.

Furthermore, Applicants note that the art cited by the Examiner fails to disclose, or even acknowledge, a relationship between the methods disclosed in the present application

and the AAP and SFC properties observed by specifying an extraction rate of the multivalent metal compound, as taught by example embodiments.

As such, Applicants submit that Mertens fails to teach, or suggest, that “an extraction rate of the multivalent metal component around a surface of said particulate water absorbent resin is 5.0 wt % or more and less than 70 wt %” as recited in amended independent claim 1.

Accordingly, Applicants submit that Mertens fails to teach, or suggest, all the features recited in amended independent claim 1.

ii. HATSUDA AND NAKASHIMA

Applicants submit that Hatsuda and Nakashima, individually or in combination, fail to teach, or suggest, that the extraction rate of the multivalent metal component around a surface of said particulate water absorbent resin is 5.0 wt % or more and less than 70 wt%. Therefore, Hatsuda and Nakashima fail to cure the deficiencies of Mertens with respect to amended independent claim 1.

Accordingly, Applicants submit that Mertens in view of Hatsuda and/or Nakashima fails to teach, or suggest, “an extraction rate of the multivalent metal component around a surface of said particulate water absorbent resin is 5.0 wt % or more and less than 70 wt %” as recited in amended independent claim 1.

As such, Applicants respectfully request that the Examiner reconsider and withdraw the rejection to independent claim 1. Claims 2-6, 22 and 23 are allowable at least by virtue of their dependency on independent claim 1, as well as, for their own merits.

B. INDEPENDENT CLAIM 7

Independent claim 7 recites a method for producing a water absorbent resin including (*inter alia*) “adding a solution of an aqueous multivalent metal compound (B) to a particulate water absorbent resin (A) with a cross-linked surface.” Non-limiting, example embodiments may be found throughout the Specification. Applicants submit that the art cited by the Examiner fails to teach, or suggest, the above features recited in independent claim 7.

i. MERTANS

In each of Examples 1-4 and Comparative Examples 1-12 in Mertans, the cross-linked polymerizes were obtained by simultaneously mixing the multivalent metal compound, water and the surface cross-linking agent. For example, Example 1 of Mertans states “...100g of the powder a) was mixed with a solution of 1 g of ethylene glycol, 2.5 g of water and 0.5 g of aluminum sulfate 14-hydrate...” Mertans, col. 10, ll. 2-8.

That is, the multivalent metal compound in Mertans is added simultaneously with the surface cross-linking agent, not after the surface of the water absorbent resin has been cross-linked by a surface cross-linking agent, as similarly recited in independent claim 7 (*i.e.*, independent claim 7 recites “a particulate water absorbent resin (A) with a cross-linked surface”).

Applicants submit that adding the multivalent metal compound and the surface cross-linking agent simultaneously, opposed to adding the multivalent metal compound after the surface of the water absorbent resin has been cross-linked by a surface cross-linking agent, makes it difficult to extract a multivalent metal component from the resultant water absorbent resin composition.

As such, Applicants submit that Mertens fails to teach, or suggest, a method for producing a water absorbent resin composition including “adding a solution of an aqueous multivalent metal compound (B) to a particulate water absorbent resin (A) with a cross-linked surface” as recited in independent claim 7.

In addition, as further proof the instant Specification establishes an unobvious difference between the claimed invention and the cited art, Applicants submit that the concentration of aluminum (*i.e.*, the multivalent metal component) in Example 1 of Mertens is 1.13 wt % (see calculations below), similar to Comparative Example 1 of the instant Specification. Furthermore, the saturated concentration of the aluminum (*i.e.*, the multivalent metal component) in Example 1 of Mertens is 4.28%.

Thus, the concentration of the aqueous multivalent metal component (*i.e.*, 1.13 wt%) to the saturated concentration of the aqueous multivalent metal component in Example 1 of Mertens (*i.e.*, 4.28) is 0.26 (*i.e.*, 1.13/4.28), not “0.40 or more” as claimed in independent claim 7.

As such, Applicants submit that Mertens also fails to teach, or suggest, a method for producing a water absorbent resin composition including “a concentration of the aqueous multivalent metal compound (B) in the solution is 0.40 or more with respect to a saturated concentration of the aqueous multivalent metal compound (B) in the solution” as recited in independent claim 7.

As such, Applicants respectfully request that the Examiner reconsider and withdraw the rejection to independent claim 7. Claim 10 is allowable at least by virtue of its dependency on independent claim 7, as well as, for its own merits.

C. INDEPENDENT CLAIM 8

Independent claim 8 recites a method for producing a water absorbent resin composition wherein (*inter alia*) “a concentration of the multivalent metal component contained in a mixed solution including the solution of the aqueous multivalent metal compound (B) and the organic surface cross-linking agent (C) is at least 1.80 wt %.” Non-limiting example embodiments may be found through the Specification. Applicants submit that the art cited by the Examiner fails to teach, or suggest, the above features recited in independent claim 8.

i. MERTENS

Applicants maintain that each of Examples 1-4 and Comparative Examples 1-12 in Mertens uses a mixed solution including a solution of the multivalent metal compound and an organic surface cross-linking agent. The concentration of the multivalent metal component is calculated as the concentration of the multivalent metal component in the mixed solution.

For instance, because Comparative Example 8 in the present Specification and Example 1 of the Mertens have a similar composition and are prepared according to method ii) discussed on pages 63-64 of the instant Specification, Applicants submit that one of ordinary skill in the art would recognize that the concentration of the multivalent metal component in Comparative Example 8 in the present Specification and Example 1 of Mertens are similar.

Referring to Table 4 of the present Specification, Applicants maintain that the concentration of the multivalent metal component in Comparative Example 8 is 1.01 wt %. The concentration of the multivalent metal component is calculated as follows:

$$[X] = (S/T) \times 100 = (0.5 / (1.0 + 3.0 + 0.5)) \times 100 = 11.1 \text{ wt\%}$$

$$[Y] = [X] \times (\text{MW}_{\text{AL}} \times 2 / \text{MW}_{\text{AL2(SO}_4\text{)}_3}) = 11.1 \times (27 \times 2 / 594.37) = 1.008 \text{ wt\%} \approx 1.01 \text{ wt\%}$$

wherein X is the concentration of the multivalent metal compound in the surface cross-linking agent, S is the weight of the $\text{Al}_2(\text{SO}_4)_3 \cdot 14\text{H}_2\text{O}$, T is the combined weight of the ethylene glycol, water and $\text{Al}_2(\text{SO}_4)_3 \cdot 14\text{H}_2\text{O}$, and Y is the concentration of the multivalent metal component.

Applicants submit that if the concentration of the multivalent metal component in Example 1 of Mertens is calculated using the same calculations, then the concentration is 1.13 wt%, lower than the “at least 1.80 wt%” as recited in independent claim 8.

Thus, Applicants maintain that Mertens fails to teach, or suggest, “a concentration of the multivalent metal component contained in a mixed solution including the solution of the aqueous multivalent metal compound (B) and the organic surface cross-linking agent (C) is at least 1.80 wt %” as recited in independent claim 8.

As such, Applicants respectfully request that the Examiner reconsider and withdraw the rejection to independent claim 8. Claims 12, 13, 14, 15 and 20 are allowable at least by virtue of their dependency on independent claim 8, as well as, for their own merits.

D. INDEPENDENT CLAIM 9

Independent claim 9 recites a method for producing a water absorbent resin wherein (*inter alia*) “a concentration of the multivalent metal component contained in a mixed solution including the solution of the multivalent metal compound (B) and the organic surface cross-linking agent is at least 1.80 wt %.” Accordingly, Applicants submit that independent claim 9 is patentable over the cited art for reason analogous to those discussed above with respect to independent claim 8.

As such, Applicants respectfully request that the Examiner reconsider and withdraw the rejection to independent claim 9. Claims 16, 17, 18, 19 and 21 are allowable at least by virtue of their dependency on independent claim 9, as well as, for their own merits.

CONCLUSION

Accordingly, in view of the above, reconsideration of the rejections and allowance of each of claims 1-10 and 12-23 in connection with the present application is earnestly solicited.

Should there be any matters that need to be resolved in the present application; the Examiner is respectfully requested to contact the undersigned at the telephone number below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By 
Donald J. Daley, Reg. No. 34,313

DJD/CDW:psy

P.O. Box 8910
Reston, Virginia 20195
(703) 668-8000